



Comments on Cabrillo Port LNG Deepwater Port Revised Draft EIR

State Clearinghouse Number: 2004021107

Pacific Environment is a non-profit organization based in San Francisco, CA. We are the leading facilitator of the coalition Ratepayers for Affordable Clean Energy (RACE), a coalition of 20 organizations representing coastal communities and clean energy advocates from Mexico to Oregon. Pacific Environment is in agreement with the project-specific comments provided by the Environmental Defense Center, particularly in light of the fact, as spelled out in the following pages, that California does not need LNG to meet its energy demand.

We are very concerned with the current push to import LNG into California. We do not feel this is based on need, but rather is a move by a multi-national industry to profit off of our energy needs by committing us to long term LNG contracts. The focus of these comments will be on the presumed need for LNG that is alluded to in the EIR.

Please feel free to contact me if you have any questions or concerns with the comments on the following pages. Thank you for your consideration.

Rory Cox
California Program Director
Phone: 415.399.8850 x302
Email: rcox@pacificenvironment.org

1. Economic impact of LNG – Section 1.2.3 indicates that “....today’s high natural gas prices reflect declining supplies, increased competition from other states to satisfy the regional natural gas demand, and the dominant effect the U.S. natural gas market has upon California prices.”

Presumably, this passage was written when natural gas was selling at over \$15 MMBTU. The price has since reduced by more than half of its December ’05 peak, to \$7 MMBTU, and it continues to drop. A recent report published by the Midwest Attorneys General Natural Gas Working Group concludes that the run-up in price has very little to do with “declining supplies.” As the report details, supply and demand of natural gas through the 2005-2006 winter are about where they have been for the last two years, while gas in storage is at or near record levels. Even though the supply-demand ratios are similar to the ’04-’05 winter, the laws of supply and demand would indicate similar gas prices. Yet prices were up over 60 percent at the wellhead and in the spot market.¹

The report summarizes a poorly regulated trading regime that defies the usual laws of supply and demand:

First, the widespread reliance on natural gas commodity markets to set the price paid by consumers is an extremely recent phenomenon, just over 15 years old. As evidenced by the wild, irrational swings in natural gas prices, these new markets have not worked well. They are deemed to be “inefficient” in technical academic studies and have a history of manipulation, abuse and misreporting.

Second, natural gas has supply and demand characteristics that make it vulnerable to abuse and volatility, yet the markets in which wholesale natural gas prices are set are less regulated than many other commodity markets. Many in the industry believe these markets lack transparency and are vulnerable to abuse and manipulation. Regulators have failed to lay these concerns to rest because the vast majority of gas trading is subject to little monitoring or oversight. While regulators and policymakers have been scrambling to reform the market rules for this commodity, they have yet to impose comprehensive oversight and accountability.

Physical market fundamentals—a tight supply/demand balance—are not adequate to explain either the short-term or long-term behavior of natural gas prices. This does not mean that tight markets do not matter—of course they do—but identifying physical market fundamentals is only the beginning of the story, not the end.²

There is no evidence that LNG will have a downward effect on energy costs in California. In fact, it’s likely that energy costs will rise due to a simple fact: The

¹ Cooper, Mark. *The Role of Supply, Demand and Financial Commodity Markets in the Natural Gas Price Spiral*. Prepared for Midwest Attorneys General Natural Gas Working Group. Washington, DC. Consumer Federation of America. March 2006. Page 4 – 6.

² Cooper, Mark. *The Role of Supply, Demand and Financial Commodity Markets in the Natural Gas Price Spiral*. Prepared for Midwest Attorneys General Natural Gas Working Group. Washington, DC. Consumer Federation of America. March 2006. Page 3.

production cost of LNG, from \$3.50 to over \$4 per MMBTU, is significantly higher than that of domestic natural gas, which is well under \$3 per MMBTU.

In addition, dependence on LNG will make the state's ratepayers vulnerable to the even more complex vagaries of international gas trading regimes. California will be competing on price and supply with markets around the Pacific Rim, including Japan, China, South Korea, and India. All of these markets are investing in greater LNG capacity. While it's impossible to predict the future price of LNG, all indications are that it will go up.

According to Wall Street energy analyst Andrew Weissman,

...even if a number of these proposed new (LNG) mega-projects are completed, other countries may outbid the U.S. for all or most of the available output from some or all of the projects that come on line in the next 5 or 10 years. Notwithstanding these obvious risk factors, the feasibility and potential costs, benefits and risks of a strategy for meeting future U.S. energy needs that depends heavily on being able to massively increase net imports of LNG have never been carefully examined by any federal or state agency and has not been the subject of extended discussion or debate at the federal level.

Instead, a major shift in U.S. energy policy that is likely to have major impacts on the U.S. economy for decades and could cost hundreds of thousands of Americans their jobs has occurred largely in a vacuum....

A heavily LNG-dependent strategy for meeting future U.S. energy needs presents at least four fundamental risks:

- The LNG supplies available to the U.S. market over the next 10 to 15 years are virtually certain to fall below the levels currently being assumed in EIA's forecasts....
- While LNG initially was held out as a potential low cost fuel that would help constrain natural gas prices in the U.S., in the current, supply-constrained global energy market, there is little reason to expect LNG to remain a low cost alternative....
- A heavily LNG-dependent strategy virtually guarantees that U.S. manufacturers will be at a competitive disadvantage in attempting to compete in global markets....
- Just as significantly, even if a heavily LNG-dependent strategy is successful in obtaining targeted levels of supply (which is extremely doubtful), it would massively increase U.S. dependence on imported fuels and have a major adverse impact on the U.S. balance of payments deficit....
- Further, since a lead time of 5 to 7 years is required to significantly expand LNG supplies, and maintaining "spare" LNG production capacity is prohibitively expensive, a heavily LNG-dependent strategy for satisfying U.S. natural gas requirements, without developing other new sources of supply, would leave the U.S. vulnerable to severe natural gas and electricity price spikes and supply shortages in any year in which demand for natural gas significantly exceeds expected levels.³

³ Weissman, Andrew D. *Where Will the Gas Come From?* Energy Ventures Group, LLC. 2005.

Based on these and other analyses, it's clear that LNG will not bring any sort of price relief to California ratepayers or businesses.

2. Natural Gas need in CA - We agree that California's natural gas demand will be slower than the rest of the country. The modest growth we may see can be made up for with domestic natural gas supplies.

The U.S. Department of Energy has consistently reported that North America has enough gas supplies to last at least 60 years. Domestic gas production is expected to rise from 19.4 Trillion cubic feet (Tcf) in 2001 to 26.4 Tcf in 2025. Meanwhile, demand for natural gas in California has decreased by about 20 percent since 2000, a result of conservation and increased renewable development. Only modest increases in natural gas demand are predicted by the California Energy Commission over the next 20 years, and demand levels are not expected to reach the highs seen in 2000 in that time period. There is a good balance between supply and demand, increasing production, higher rig counts, and robust storage.

However, rather than prudently utilize domestic sources of natural gas, it is seemingly the state's policy to favor natural gas imports from foreign countries. On September 4, 2004, the California Public Utilities Commission passed, by a 3 to 2 vote, a rulemaking that authorizes the state's utilities to reduce their purchase of domestic natural gas in order to make room for imported LNG.

The decision states,

IT IS ORDERED that:

1. Southern California Gas Company (SoCalGas), San Diego Gas & Electric Company (SDG&E), Pacific Gas & Electric Company (PG&E), Southwest Gas Company (Southwest) and Southern California Edison Company are granted authority to negotiate reduced amounts of capacity and to terminate expiring contracts with El Paso Natural Gas Company, Transwestern Pipeline Company or Gas Transmission Northwest Corporation while preserving the rights of first refusal....
6. Within 30 days of this decision, PG&E, SoCalGas and SDG&E shall submit, for Commission approval, non-discriminatory open access tariffs for all new sources of supply, including potential liquefied natural gas (LNG) supplies....
7. SoCalGas and SDG&E are permitted to establish receipt points, as needed, at Otay Mesa, Salt Works Station and Center Road Station, or at other receipt points.
- 7.a. Otay Mesa shall be designated a common receipt point for both SoCalGas and SDG&E, and an interim transportation rate consisting of the applicable SDG&E or the SoCalGas tariff rate shall apply to deliveries through Otay Mesa.
8. Within three months of the issuance of this decision, SoCalGas and SDG&E shall file an application to request implementation of its transmission system integration and firm access rights proposals.⁴

⁴ Peevey, Michael; Brown, Geoffrey; Kennedy, Susan. *Order Instituting Rulemaking to Establish Policies and Rules to Ensure Reliable, Long-Term Supplies of Natural Gas to California, Rulemaking 04-01-025*. California Public Utilities Commission, September 2004. Page 97.

In the same OIR, the CPUC was alerted in filings by the coalition Ratepayers for Affordable Clean Energy (RACE) that because the presumed need for LNG was based on dubious information of supply and demand, that it was incumbent on the CPUC to hold a public, evidentiary hearing on the need for LNG. However, in the same September 4 rulemaking cited above, RACE's request for such a hearing was denied. To this day, the state has yet to conduct any sort of credible process by which the need for LNG has been established.

Cutting off plentiful domestic gas supplies while becoming reliant on foreign sources puts California's energy grid in peril. For example, the impact of a natural disaster is magnified. The 2005 Gulf coast hurricanes did not pose a short term supply problem for California. This is because most of California's natural gas comes from dispersed sources around the Western U.S. and Canada, and because gas storage rates remained high nationwide, despite 7.5 percent of our nationwide natural gas production being temporarily interrupted by 2005 hurricane damage.

However, the Cabrillo Port project will supply 800 MMcfd per day, which is a significant portion of California's gas supply, coming through one access point. California's coast is not immune to devastating disasters, including earthquakes, tsunamis, and intense storms, which are covered more completely in others' comments. Political instability at the foreign source of LNG is also a concern. With the CPUC granting the utilities the right to cancel domestic contracts, it's doubtful we will be able to rely on our plentiful domestic resources in such an event.

3. Natural Gas demand reduction: The EIA does not consider energy efficiency or renewable energy as a reasonable alternative to the LNG project (Sections 3.3.1, 3.3.2, 3.3.3.) However, this ignores the spirit of our state's energy policy, especially the loading order described in the state's energy action plan. Importing LNG radically subverts what is a sane plan for our energy future.

That loading order states:

The loading order identifies energy efficiency and demand response as the State's preferred means of meeting growing energy needs. After cost-effective efficiency and demand response, we rely on renewable sources of power and distributed generation, such as combined heat and power applications. To the extent efficiency, demand response, renewable resources and distributed generation are unable to satisfy increasing energy and capacity needs, we support clean and efficient fossil-fired generation.⁵

While the state has done an admirable job of maintaining natural gas demand through efficiency measures, there are many more opportunities that have yet to be exploited. Certainly, one of the most cost-effective is the re-powering of our aging fleet of power plants. The EIR states, "the CEC has determined that the State's natural gas supply must be

⁵ California Energy Commission and California Public Utilities Commission. *California Energy Action Plan II, Implementation Roadmap for Energy Policies*. September 21, 2005, P. 2

increased whether or not re-powering occurs.” It also states that “The turbine re-powering alternative is moving forward and would not be affected by decision on the proposed Project.”

However, the EIR fails to quantify these claims. A recent study by the Community Environmental Council concluded that energy efficiency measures, most of which are non-mandated but agreed upon by the CPUC, can alone meet 134% of new natural gas demand by 2016. These measures include the Green Building Initiative, the CPUC’s goal to reduce natural gas consumption by 444 million therms by 2013, the CPUC’s goal to reduce electricity demand by 26,508 GWh by 2013, and the re-powering of the state’s aging non-peaking natural gas plants.⁶

Renewable energy is another potential source of reducing natural gas demand, and a viable alternative to BHP Billiton’s LNG project. The Community Environmental Council report calculated that Governor Schwarzenegger’s renewable goals, in addition to efficiency goals, more than compensate for our future energy demand.

Under the more aggressive renewable portfolio standard goal—33 percent by 2020—as much as 108,561 GWh per year would be produced from renewable sources, equivalent to about 16,500 MW of electrical generation capacity and 180 percent of a large LNG import terminal. The 33 percent standard is likely to become law in 2006, given the fact that the Governor signed a law in 2005 calling for an examination of the feasibility of this level of renewables, and the subsequent completion of this examination, finding, as mentioned, that the 33 percent RPS is both feasible and cost-effective.⁷

To summarize the Community Environmental Council’s findings on the sum total of what California’s future energy portfolio will look like without BHP Billiton’s project,

It should be clear at this point that energy efficiency and renewable energy could readily replace the need for any LNG import terminals in California.

California’s future energy path will depend largely upon the willingness of policy-makers to embrace energy efficiency and renewable energy as the preferred approach to the state’s most pressing environmental issues. The reasons for supporting renewable resources and energy efficiency, rather than supplementing natural gas supplies through LNG, may be boiled down to a few main points.

First, **California’s natural gas demand projections are likely too high** due to exclusion of California’s full energy efficiency and renewable energy goals and other potential in the state’s natural gas demand projections.

Second, **California benefits from a variety of energy efficiency and renewable energy resources that, if developed to their full potential, could eliminate the need for any addition to our current fossil fuel supply base** – and could eventually

⁶ Hunt, Tam; Chan, Allison; Phillips, Jenny. “Does California Need Liquefied Natural Gas? The Potential for Energy Efficiency and Renewable Energy to Replace Future Natural Gas Demand.” March 2006. P. 16 – 17

⁷ *Ibid.* Page. 19

eliminate a large portion of our fossil fuel demand, and perhaps even all of our fossil fuel and nuclear demand.

Third, **significant additional supplies of natural gas are likely to be available in California** even if California builds no LNG import terminals. This is the case because of the proposed natural gas pipelines from Alaska and Canada and, in the shorter term, numerous new LNG import terminals being built in Mexico, Canada and other parts of the U.S. Additional natural gas supplies from North American sources and LNG terminals outside of California are an effective hedge against the possibility that the state might not reach its full renewable energy and energy efficiency potential by 2016.⁸

⁸ *Ibid.* Page 30

URL: http://www.venturacountystar.com/vcs/opinion/article/0,1375,VCS_125_4599211,00.html

Question may no longer be whether LNG, but when?

By Thomas D. Elias

April 6, 2006

The question, apparently, may no longer be whether liquefied natural gas will be arriving soon in California, but where.

This is true even though there has never been a definitive study of whether the state needs this expensive new energy source, natural gas frozen into a liquid form in a variety of far-off foreign locations, then brought here by tanker, warmed back to a gaseous state and piped to homes and businesses.

This is true even though there has yet to be any public hearing where advocates of LNG who stand to make billions of dollars on their projects could be cross-examined on questions of need and price.

This is true even though a gas industry trade journal reported a boom last winter in domestic American gas production, with storage capacity at a premium and wholesale prices-dropping.

What independent studies do exist indicate that natural-gas use in California has been flat and even dropping slightly and that North American sources of gas in Texas, Oklahoma, Colorado, Wyoming and Alberta probably could supply all this state would need for the foreseeable future.

State officials chose to focus instead on one study funded by Sempra Energy, the San Diego-based firm that owns San Diego Gas & Electric Co. and the Southern California Gas Co. Not surprisingly, the Sempra-funded study concluded California will need LNG and Sempra will likely be the first to provide it. How reliable is Sempra's analysis? Some say it's good, others say no.

Meanwhile, construction goes forward on Sempra's LNG project in Baja California, the first LNG receiving facility on the West Coast.

Sempra pledges its LNG will not raise prices for consumers. That might be correct given today's high prices, still feeling Hurricane Katrina's effects and fears that a new war might disable Iran's ability and willingness to produce gas. But retail prices will likely drop when those crises abate; wholesale prices already have. Still, the LNG juggernaut looks more and more like a bandwagon.

Shipyards worldwide have orders for 126 new natural-gas carriers. The current world fleet is 184.

Pacific Gas & Electric Co. and two other firms announced plans in March to build a pipeline linking Northern California to a proposed LNG terminal at Coos Bay, Ore. A key PG&E partner in this: the Williams Cos. energy firm of Tulsa, Okla., which was one of the first market manipulators caught cheating during the energy crunch early this decade.

A major Australian company entered the California LNG sweepstakes in late winter, announcing it can use a new and safer process to regasify LNG. Woodside Energy Ltd. says it could regasify LNG aboard ship, then put it directly into a pipeline extending offshore without building a big and expensive receiving plant. The firm's plan to unload in the Santa Monica Bay about 24 miles southwest of Los Angeles International Airport is a major departure from what Sempra is building and what others propose at Long Beach and off the coast of Ventura County.

None of this would be happening if the energy world did not simply assume LNG will be approved and in use in California sometime later this decade.

4/6/2006

It's an assumption every powerful interest in the state now makes because all have bought into the idea LNG is needed. There has been no effort at all to assure guarantees of price cuts here when worldwide gluts of natural gas appear. There's also a general tendency to disregard two lawsuits pending before state appellate courts by the consumer group Ratepayers for Affordable Clean Energy.

The state's largest newspaper editorializes that "California badly needs 2 imported natural gas" even though that assertion is totally unproved. Gov. Arnold Schwarzenegger not only favors fast development, but has a pet project — one proposed by Australia's BHP Billiton off the coast of Oxnard.

Only rarely has California seen such massive support for an unproven new scheme. One such occasion was the unanimous backing electricity deregulation received from state legislators, the governor and the state energy and public utilities commissions in 1996.

With little on the horizon seeming likely to stop it, Californians can only hope LNG does not turn out to be a equally disastrous.

— Thomas D. Elias, of Santa Monica, is a columnist and author. His e-mail address is tdelias@aol.com.

Current Natural Gas and LNG Projections

James M. Kendell
Energy Information Administration

James.Kendell@eia.doe.gov

National Association of Regulatory Utility Commissioners
July 29, 2003
Denver, Colorado



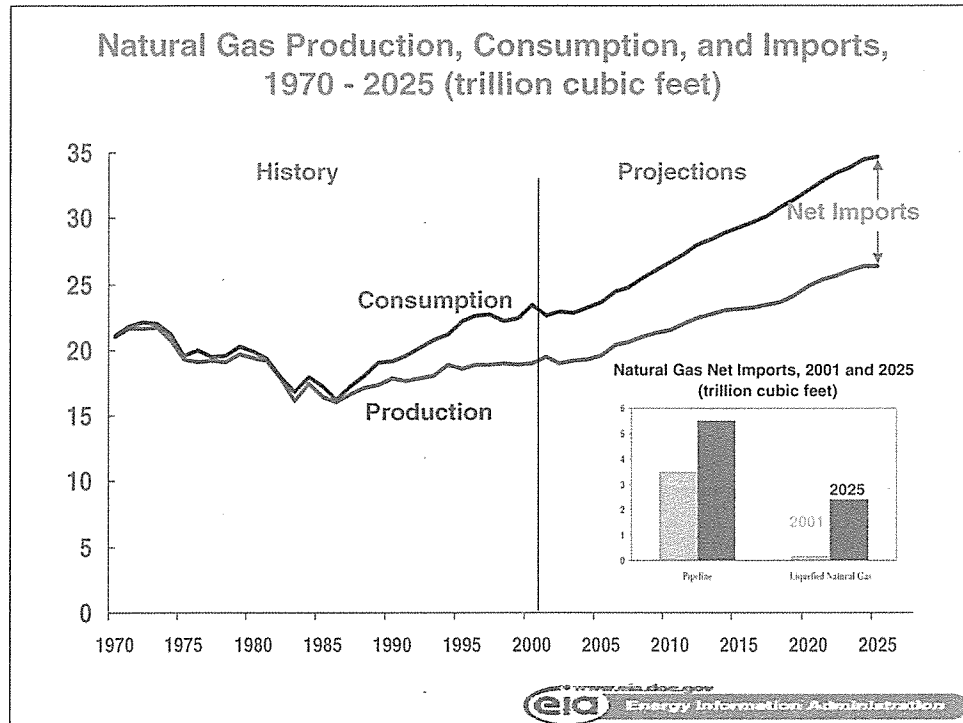
This morning I'm going to talk about EIA's mid-term natural gas outlook. How much are we going to use? Where's it going to come from? How much will it cost?

These projections are from the reference case from the *Analysis of S.139, the Climate Stewardship Act of 2003*, a new report issued on July 3. It was an update from our *Annual Energy Outlook 2003*. The projections focus on domestic energy consumption, supply, and prices. They are the product of the Energy Information Administration, an independent analytical and statistical agency within the U.S. Department of Energy. We do not speak for any particular point of view on energy policy, and our views should not be construed as representing those of the Department or the Administration.

Assumptions are critical to any forecast. The projections are not statements of what *will* happen but of what *might* happen, given certain assumptions. The reference case projections are business-as-usual forecasts, given known technology and technological trends, demographic trends, and current laws and regulations.

EIA does not propose, advocate, or speculate on changes in laws and regulations. So, one of our key assumptions is that all current laws and regulations remain as enacted. For the mid-term forecast, that means, for example, that provisions in the current House and Senate energy bills, such as an Alaska gas pipeline tax credit, are not included in this forecast.

Let's start with an overview of the forecast.



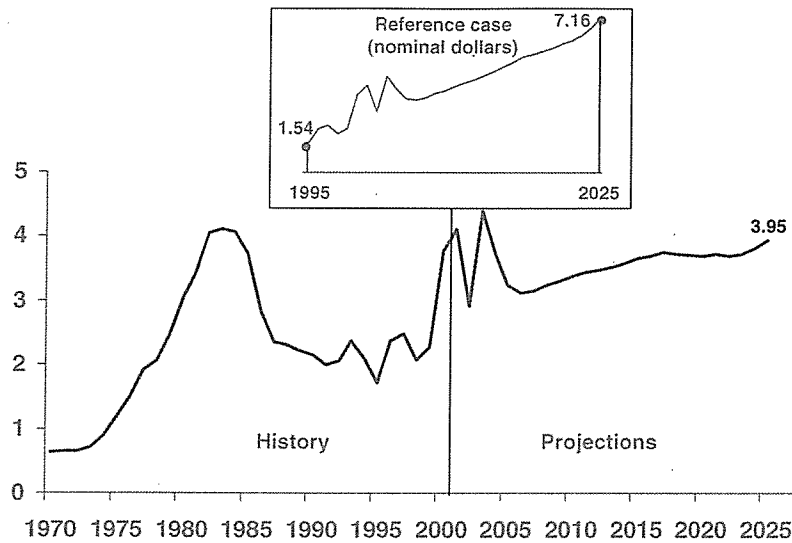
By 2025 total natural gas consumption is expected to increase to almost 35 Tcf or 26 percent of U.S. delivered energy consumption.

Domestic gas production is expected to increase more slowly than consumption over the forecast, rising from 19.5 Tcf in 2001 to 26.4 Tcf in 2025. Growing production reflects increasing natural gas demand and is supported by rising wellhead gas prices, relatively abundant gas resources, and improvements in technologies, particularly for unconventional gas. In this forecast, economic conditions allow an Alaskan pipeline to begin moving gas to the lower 48 States in 2020. The national average wellhead price is projected to reach \$3.95/Mcf in 2001 dollars by 2025.

The difference between consumption and production is made up by increasing use of imports throughout the forecast, particularly from liquefied natural gas (LNG), with a 2.1 Tcf increase expected over 2001 levels. By 2025 we expect expansion at three of the four existing terminals and construction of new LNG terminals in the Bahamas, on the Eastern Gulf Coast, and in Baja California, Mexico.

I'll spend the rest of my talk looking at prices, consumption, production, and imports in more detail—starting with prices.

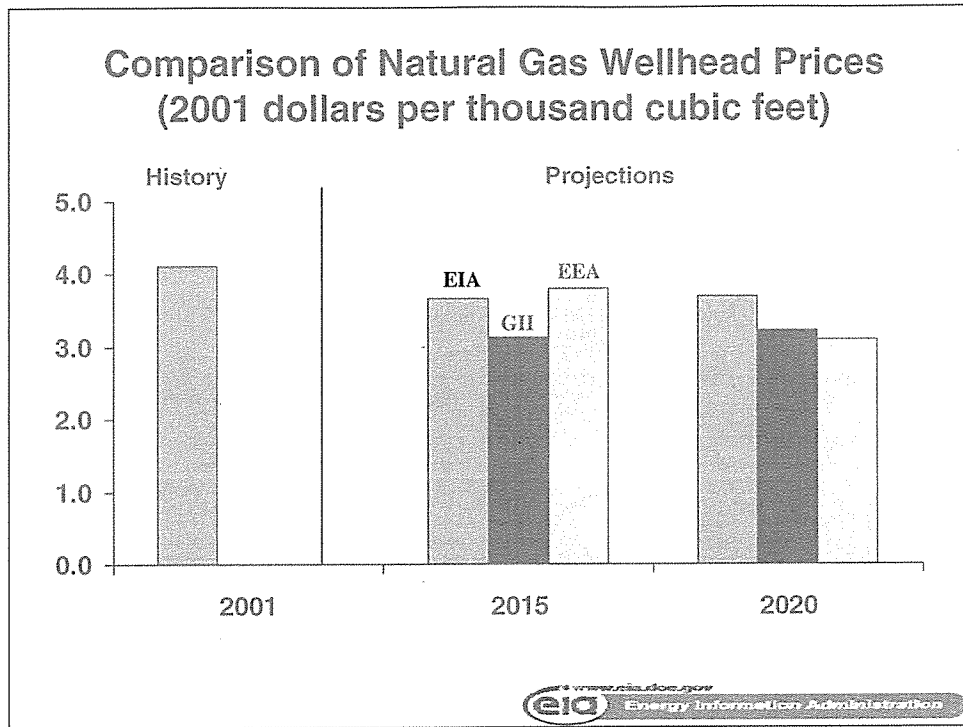
Lower 48 Natural Gas Wellhead Prices, 1970-2025 (2001 dollars per thousand cubic feet)



Natural gas wellhead prices are projected to decline from their current high levels, falling to just over \$3 per thousand cubic feet in 2006 due to robust drilling. Over the forecast, gas prices are projected to move higher, reaching \$3.95 per mcf by 2025 or 31 percent higher than the average of the last 5 years. In nominal dollars, this is equivalent to about \$7.20 per mcf.

Natural gas wellhead prices are projected to move higher as technology improvements and new supply sources prove unable to completely offset the effects of resource depletion and increased demand.

Prices are projected to increase in an uneven fashion as major new, large-volume supply projects temporarily depress prices when initially brought online. These include deep and ultra-deep offshore projects in the Gulf of Mexico, liquefied natural gas facilities, the MacKenzie Delta pipeline in Canada, and an Alaskan natural gas pipeline.

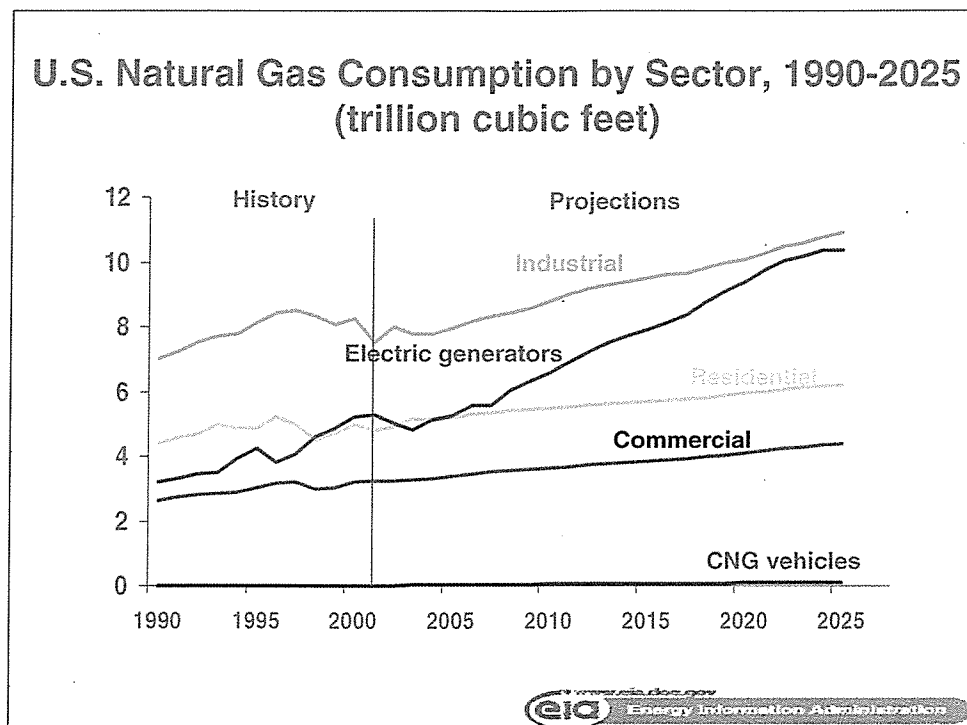


To give you a sense of how these prices compare to some other forecasts, let me show you a couple other data points.

With the exception of the Energy and Environmental Analysis projection for 2015, all the wellhead price projections in the EIA forecast are higher than the other forecasts, in part because EIA projects generally higher domestic production levels. Similarly, in some work with the Energy Modeling Forum for the EMF20 natural gas study that's about to be released, EIA's price forecasts were higher than those of six other modelers under reference case conditions.

Unfortunately, price comparisons in isolated years can be difficult. For instance, the incorporation of a cyclical price trend based on exploration and production cycles in the Energy and Environmental Analysis forecast makes particular year comparisons problematic.

Now, let's look at consumption in a little more detail.



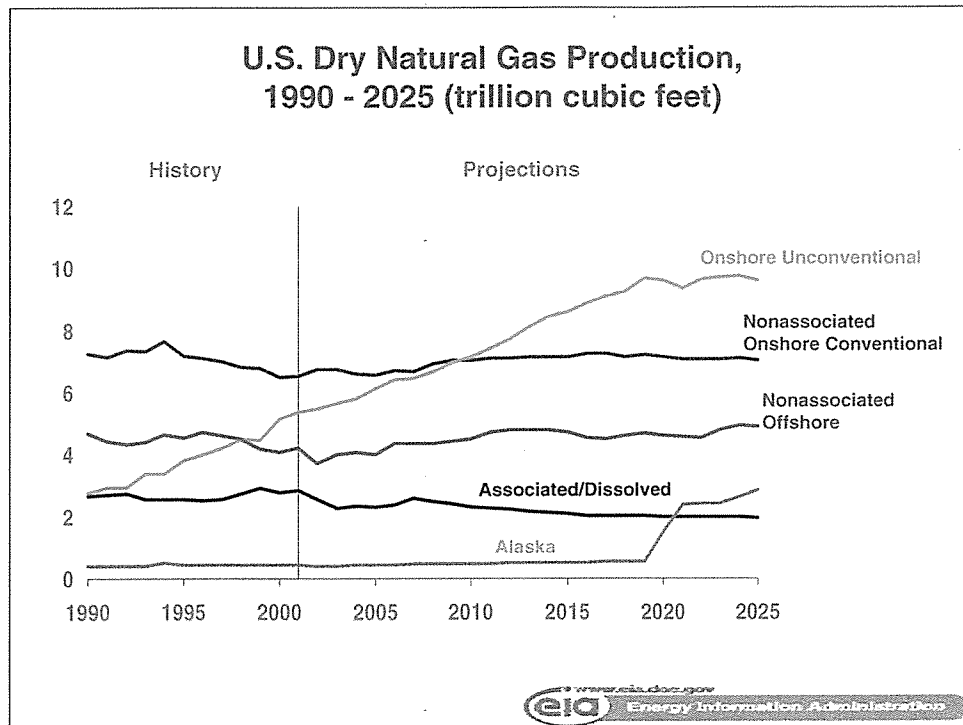
U.S. natural gas consumption is expected to increase by 1.8 percent annually from 2001 through 2025, to nearly 35 trillion cubic feet (Tcf). Gas consumption by electric generators is expected to nearly double over the forecast, from 5.3 trillion cubic feet in 2001 to 10.4 trillion cubic feet in 2025. Demand by electricity generators is expected to account for 30 percent of total natural gas consumption in 2025.

Most new electricity generation capacity is expected to be fueled by natural gas, so natural gas consumption in the electricity generation sector is projected to grow rapidly throughout the forecast as electricity consumption increases. Although average coal prices to electricity generators are projected to fall throughout the forecast, natural-gas-fired generators are expected to have advantages over coal-fired generators, including lower capital costs, higher fuel efficiency, shorter construction lead times, and lower emissions.

Historically the industrial sector, excluding lease and plant fuel, is the largest gas-consuming sector, with significant amounts of gas used in the bulk chemical and refining sectors. Industrial consumption is expected to increase by 3.4 Tcf over the forecast, driven primarily by macroeconomic growth. The chemical and metal durables sectors show the largest growth.

Combined consumption in the residential and commercial sectors is projected to increase by 2.5 Tcf from 2001 to 2025, driven by increasing population, healthy economic growth, and slowly rising prices in real terms. Natural gas remains the overwhelming choice for home heating throughout the forecast period, with the number of homes heated by natural gas rising nearly 18 million.

Now let's move from the demand side to the supply side.



Domestic gas production is expected to increase from 19.4 Tcf in 2001 to 26.4 Tcf in 2025. Increased U.S. natural gas production comes primarily from unconventional sources and from Alaska.

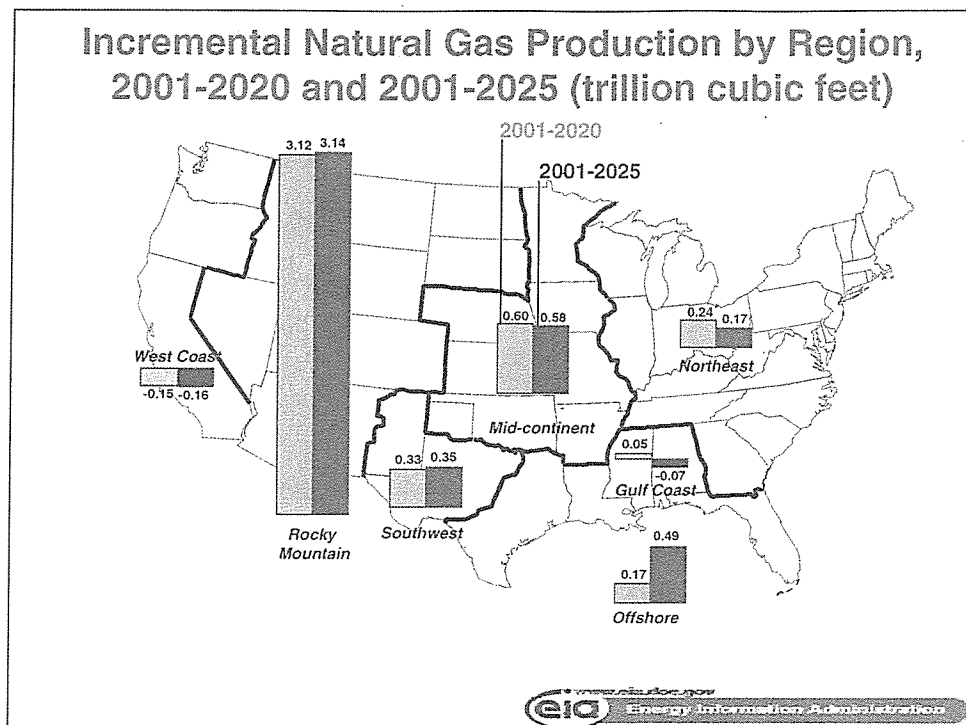
Unconventional gas production increases by 4.2 Tcf over the forecast period—more than any other source, largely because of expanded tight sands gas production in the Rocky Mountain region. Annual production from unconventional sources is expected to account for 36 percent of production in 2025, more than any other source, compared to 28 percent today.

Alaska natural gas production begins flowing to the Lower-48 States in 2020 along a pipeline through Canada, reaching 4.5 bcf per day in 2021, with further expansion beginning in 2024. Alaska also continues to provide for consumption in the State itself and for LNG exports to Japan. In 2025, total Alaskan gas production is projected to be 2.9 Tcf.

Non-associated offshore production adds 710 Bcf, with increased drilling activity in deep waters; however, its share of total U.S. production declines from 22 percent in 2001 to 19 percent by 2025. Conventional onshore non-associated production increases by 500 bcf over the forecast, driven by technological improvements and rising natural gas prices.

Associated dissolved production declines by 900 Bcf, consistent with a projected decline in crude oil production. Lower 48 associated-dissolved natural gas is projected to account for 7 percent of U.S. natural gas production in 2025, compared with 15 percent in 2001.

Now, let's look at the same growth on a regional basis.



The Rocky Mountain region, with the majority of the unconventional production, shows the greatest increase in production due to improved technologies and the availability of abundant resources. Over the forecast the Rocky Mountain region goes from the third highest to the highest producing region.

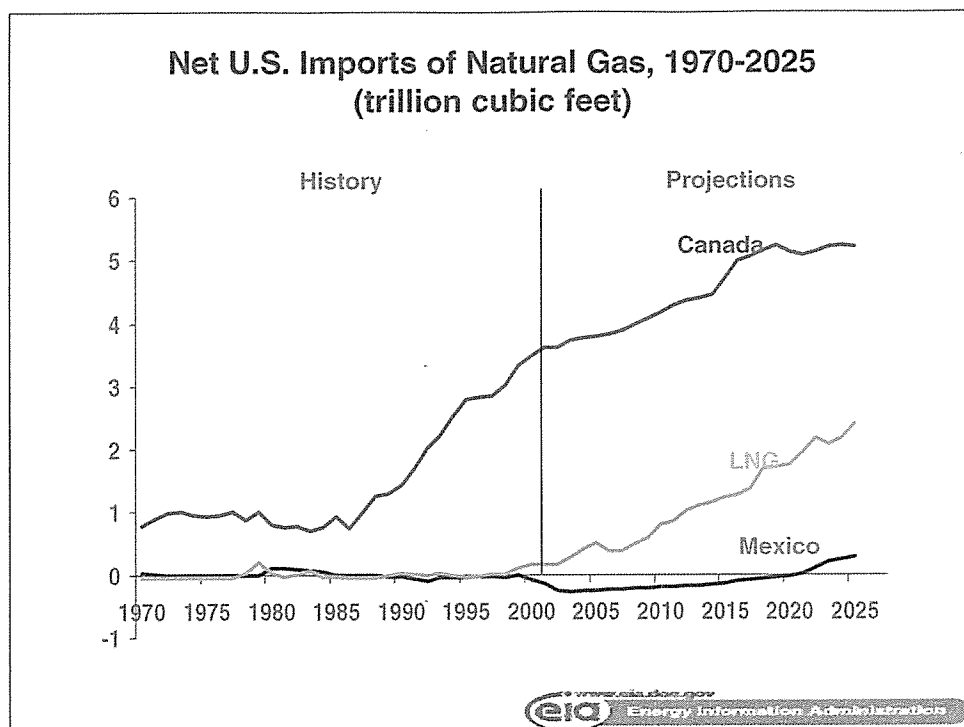
The highest producing region until 2014 is the Gulf offshore. At first deepwater production is expected to offset the decline in production from shallow fields. Discoveries of large ultra-deep fields in the Gulf of Mexico may temporarily interrupt the declining trend after that. But compared to 2001, production in 2025 is up by only about half a Tcf. The onshore Gulf Coast region is the second or third highest producing region throughout the forecast, but over the forecast it actually declines.

The Mid-continent region grows at about the same rate as the total Lower 48 production, generally maintaining its regional share.

The Southwest region is one of only two regions that does not show a decline in production toward the end of the forecast. Much of the increase in production is due to advances in technologies that improve the ability to develop resources from gas shales and deep conventional fields, greater than 10,000 feet.

The Northeast continues to be the second lowest producing region throughout the forecast and is not expected to add significant production. The West Coast including the offshore is one of two regions that shows an overall decline over the forecast period.

Now, let's look at the other source of supply, which is imports.



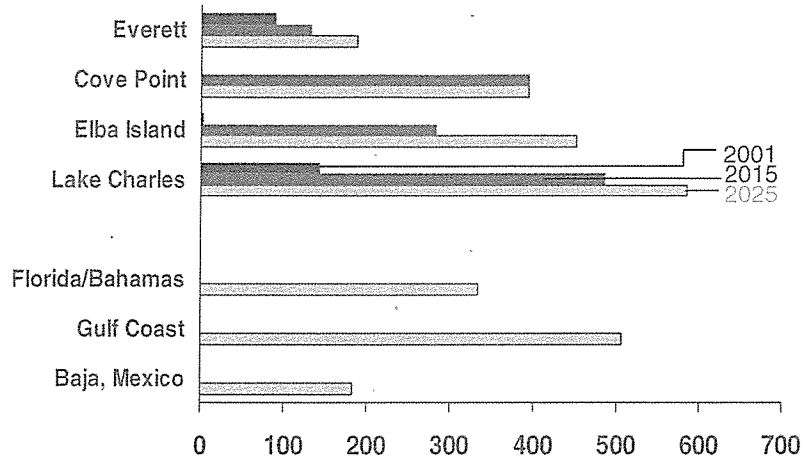
Net imports of natural gas, primarily from Canada, are projected to increase from 3.7 trillion cubic feet in 2001 to 7.9 trillion cubic feet in 2025. Imports contributed 16 percent to total natural gas supply in 2001, compared to 23 percent in 2025.

More than half of the increase in U.S. imports is expected to come from LNG. Much of the increase comes from expansion at existing sites, but additional facilities are also built to serve Florida and the Eastern Gulf Coast. The new LNG facilities are expected to have a combined gas delivery rate of 2.3 billion cubic feet per day. By 2025, LNG imports are expected to equal 7 percent of total U.S. gas supply.

Growth in pipeline imports from Canada partly depends on the completion of the MacKenzie Delta pipeline, which is expected to be completed in 2015 and expanded in 2022. The initial full flow rate into Alberta is assumed to be 1.5 Bcf per day. Additional imports will come from the Scotian Shelf in the offshore Atlantic. The forecast of Canadian imports largely depends on the ability of Canadian producers to economically produce and market their untapped unconventional resources, particularly coalbed methane. Net imports from Canada are projected to provide 15 percent of total U.S. supply in 2025, about the same as in 2001.

Mexico is projected to go from a net importer of U.S. natural gas to a net exporter in 2021, as another LNG facility begins operating in Baja California, Mexico, in 2021, predominantly serving the California market. By 2025, the United States is expected to import about 290 billion cubic feet of natural gas from Mexico per year.

LNG Imports by Terminal and/or Region, 2001, 2015, and 2025 (billion cubic feet)



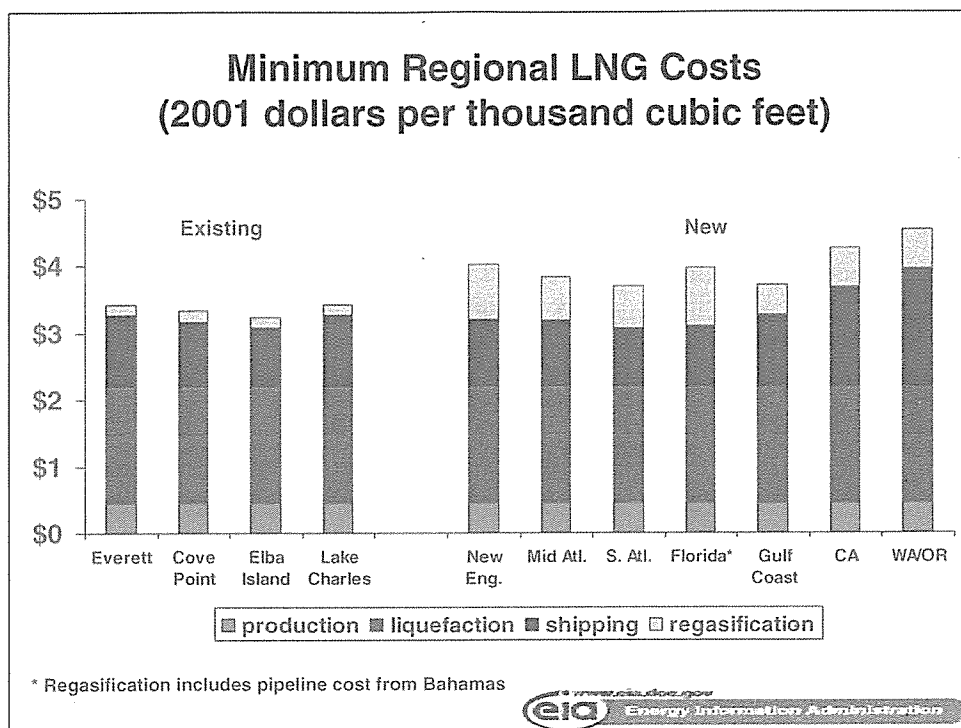
www.eia.doe.gov
 Energy Information Administration

In addition to expansion at three of the four existing terminals, our forecast calls for the construction of new terminals to serve Florida (from the Bahamas), the Gulf Coast, and California from Baja California, Mexico.

The current capacity of the four U.S. LNG facilities is 832 billion cubic feet per year; we expect that to rise to 1.47 tcf over the forecast. We see expansion at Cove Point, Elba Island, and Lake Charles continuing after 2015, but no new terminals are expected to come on line prior to 2017. Thus, much of the growth in LNG imports occurs between 2015 and 2025.

Within the NEMS model, we represent the potential for new generic facilities (with a sustained capacity of 500 million cubic feet/day) to be built in any of the coastal regions. If the market price for LNG in a region exceeds our estimated minimum cost of delivering LNG to the region, then the model begins construction of a new facility. Construction for new facilities is assumed to take 3 years.

The minimum costs range from \$3.40 in Baja California to \$4.64 in the Pacific Northwest, as we'll see on the next slide.



The cost of delivering LNG is calculated as the sum of four items: production cost, liquefaction cost, transportation cost, and regasification cost. These costs were derived from various industry sources.

Ranges for the four costs that were used in the forecast are as follows:

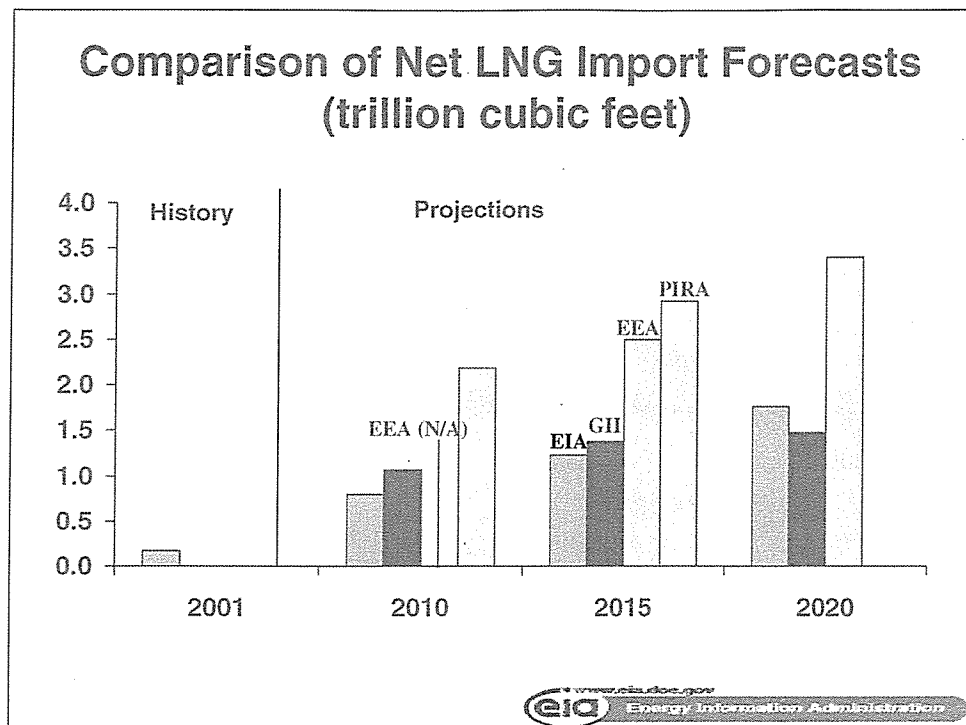
Production costs : Range from \$0.25 in Qatar to \$0.60 in Algeria in \$2001 per mcf.

Liquefaction costs : Range from \$1.32 in Algeria to \$1.72 in “other” regions. “Other” is a conglomerate of newer and/or smaller supply sources not specifically represented

Transportation costs: Range from \$0.89 from Trinidad to the South Atlantic region to \$3.72 from Qatar to California

Regasification costs: Range from \$0.45 in the Gulf Coast to \$0.87 in Florida (which includes the cost of a pipeline from the Bahamas) Note that because of lower regasification costs, expansion at existing facilities is less expensive than new construction. We have assumed that new construction will not occur in a region with an existing facility until the existing facility has expanded to its assumed maximum.

To underscore some of the uncertainty surrounding any forecast for LNG, I’d like to show how our forecast compares with some others.

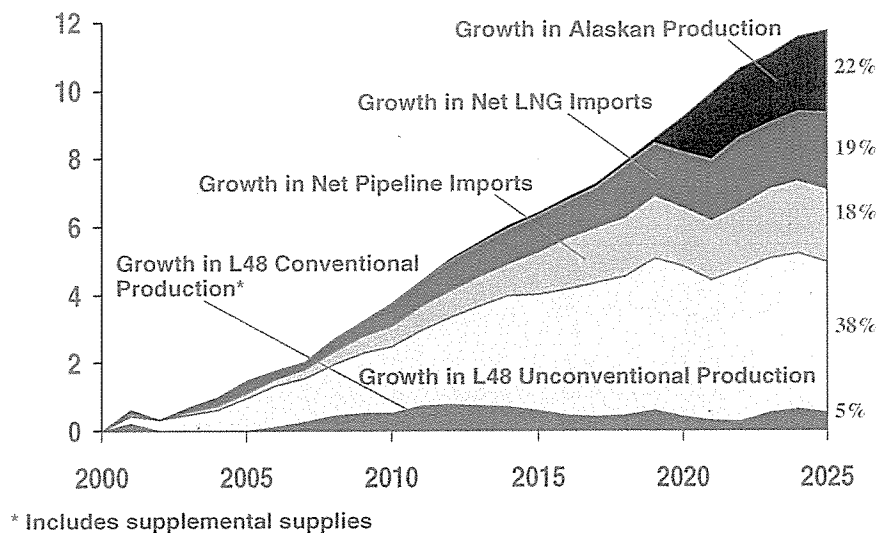


We have forecasts from Petroleum Industry Research Associates (PIRA), Energy and Environmental Analysis (EEA), and Global Insight (GII). PIRA and EEA are clearly more optimistic about the growth of the LNG market than Global Insight and EIA. PIRA and EEA expect LNG to satisfy 9 and 10 percent of domestic consumption by 2015, respectively. In contrast, Global Insight and EIA project LNG to satisfy 5 and 4 percent respectively.

While the basic economics is certainly a factor, in the end, a lot of judgment must be imposed in forecasting expanded regasification capacity in the United States. Not only must reasonable cost estimates be made, but also the likelihood of investors taking on such risk and the likelihood of necessary site licenses being approved must be assessed. The availability of ships and competition with other consumers in the world must also be assessed.

Finally, let's look at what LNG is competing against.

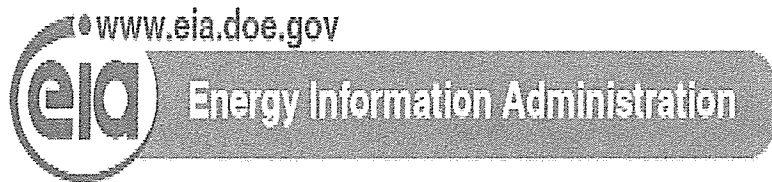
Sources of Incremental Natural Gas Supply, 2000-2025 (trillion cubic feet)



Growth in “domestic” natural gas supplies will depend on two sources: increased unconventional natural gas production and construction of an Alaskan natural gas pipeline to begin operating in 2020. Of the 11.1 tcf increase in supply from 2001 through 2025, 38 percent is expected from unconventional gas and 22 percent from Alaska.

Total nonassociated unconventional gas production is projected to grow from 5.4 Tcf in 2001 to 9.6 Tcf by 2025. Total Alaskan production is projected to increase from 0.4 Tcf in 2001 to 2.9 Tcf by 2025.

Although total net LNG imports are projected to increase from 0.3 Tcf in 2001 to 2.4 Tcf by 2025, pipeline gas from Canada and Mexico increases almost as much, from 3.5 to 5.5 tcf over the forecast. So, 18 percent of the increase comes from pipeline gas and 19 percent from LNG.



In summary, the projections indicate that more than 11 tcf of new supplies will be needed by 2025. At a wellhead price of \$3.95 per mcf in 2001 dollars, LNG imports and Alaskan production are expected to provide important new sources of supply, while unconventional and Canadian gas production continue to increase.

~~HEADLINE DRAFT~~ Midwest Attorneys General Natural Gas Working Group

March 7, 2006

Report from Working Group of State Attorneys General Finds Market Fundamentals Can't Account for Huge Increase in Natural Gas Prices Supply and Demand Alone Don't Support \$50 Billion Increase from 2004 to 2005

WASHINGTON, D.C. — A six-month study into skyrocketing natural gas prices and erratic natural gas markets concludes that traditional factors of supply and demand alone cannot account for the surge in prices and that a huge influx of money into speculative financial markets has reinforced the upward spiral of prices.

The report was released today by four Midwestern Attorneys General: Lisa Madigan of Illinois, Tom Miller of Iowa, Jay Nixon of Missouri and Peg Lautenschlager of Wisconsin. Miller, Nixon, Lautenschlager and a representative of Madigan's office discussed the findings of the report at a news conference in Washington. The report examined several causes of the natural gas prices and addressed potential remedies.

Natural gas prices climbed to all-time highs last fall and early winter, with spot prices exceeding \$15 and wellhead prices exceeding \$10 per million Btu for the first time ever. By contrast, gas prices had hovered around \$2 to \$4 per million Btu for much of the last two decades. Future prices today are far above the costs of production and, if realized, could cost consumers hundreds of billions of dollars more, the Attorneys General say. Consumers are already feeling the effects of those increases, with this season's average winter heating bills projected to exceed \$1,000 for the first time in history.

"These price increases are a problem that is both regional and national, but which is often insufficiently explained as a product of growing demand chasing dwindling supplies," said Attorney General Lautenschlager. "As Attorneys General, we are charged with protecting consumers. A cooperative approach to this common problem was the most effective and efficient means to determine what legal strategies to employ or public policy changes to advocate to best address any avoidable financial harm to the citizens of our states."

Last fall, the Attorneys General directed their staffs to begin looking into natural gas prices following dire predictions about skyrocketing costs to consumers. Staff met with invited representatives of utility companies from each state, as well as with natural gas producers, to gather information and obtain frank perspectives about the causes of the projected dramatic price increases.

In their discussion of market dynamics, the Attorneys General found greatly divergent opinions and contradictory explanations for the recent roller coaster of prices. But they say a closer look at the physical market for natural gas points to the conclusion that supply and demand fundamentals did not explain the price increases.

"What we found does not support this commonly held notion that a 'soaring' demand is driving natural gas prices," Attorney General Nixon said. "Both demand and supply have been relatively flat and steady over the past decade. The price of natural gas, meanwhile, has been all over the place, with peaks

and valleys that constantly ratchet upwards. This pattern does not square with traditional economic analysis of supply and demand.”

The Attorneys General believe a significant contributing factor has been a huge influx of money into largely unregulated financial markets, reinforcing the upward spiral of prices by increasing volatility and risk, and creating uncertainty. A lack of transparency in those speculative markets hinders effective review as well, they said.

“Under the current system, the Attorneys General have no way of knowing if or when natural gas traders are breaking the law,” said Attorney General Miller. “A more transparent system and an end to the completely opaque current system are needed so Attorneys General can make determinations on when and how to enforce the relevant laws.”

The four Attorneys General, representing 27 million consumers paying record-high natural gas heating bills this winter, urged the federal government to take action to assert basic jurisdiction over unregulated financial trading that could be contributing to the enormous increases. Common-sense changes in federal oversight policies are needed, they said, to make the markets more transparent and efficient. The policy steps outlined in the report included:

- § Oversight of the over-the-counter markets, including requirements for registration of traders and reporting of trades;
- § Stricter limits on positions held by any one entity and expanded settlement periods for short- and long-term contracts, and restrictions on how much the price of natural gas can move on the markets before trading is temporarily halted for a “cooling off” period; and,
- § A joint federal-state task force to examine critical questions about the supply-side of the physical market and the role of major oil companies, which straddle the physical and financial markets.

“Our discussions with industry insiders revealed that the extraordinarily high prices consumers are paying for this essential commodity don’t even reflect the actual market for natural gas,” said Attorney General Madigan. “Instead of the current method of setting prices based on the actions of just a few traders, we need oversight of all natural gas transactions to make sure that the prices consumers pay accurately reflect the actual supply of and demand for natural gas.”

“There is more federal oversight for the trading of commodities like soybeans, pork bellies and orange juice than there is for the trading of natural gas, which is a necessity for many Americans,” Attorney General Nixon said. “Most consumers can live without pork bellies, but they cannot live without natural gas to heat their homes.”

The study for the Attorneys General was prepared by Dr. Mark Cooper, a long-time Washington, D.C. analyst of energy and consumer issues and the author of hundreds of reports over more than 25 years on a wide variety of energy and consumer issues. He also has served as an expert witness for Attorneys General, People’s Counsels and consumer groups in hundreds of state proceedings.

The report is available online on these Web sites: <http://illinoisattorneygeneral.gov>; www.ago.mo.gov; www.IowaAttorneyGeneral.org; and www.doj.state.wi.us/docs/naturalgas.pdf

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For more information, contact:

Bob Brammer, Communications Director
Office of the Attorney General of Iowa
(515)281-6699

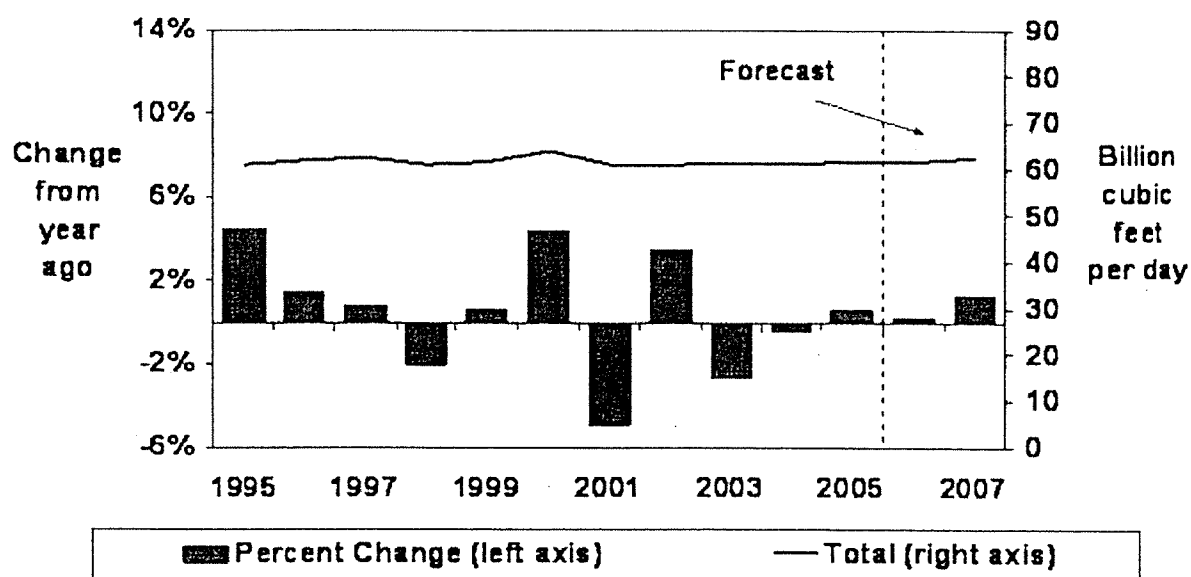
Scott Holste, Director of Communications
Missouri Attorney General's Office
(573)619-5255 (cell)

Melissa Merz, Press Secretary
Office of the Attorney General of Illinois
(312)814-3118

Kelly Kennedy, Communications Director
Office of the Attorney General of Wisconsin
(608)266-7876

EXHIBIT ES-2: NATURAL GAS DEMAND: 1995-2005

Figure 12. Total U.S. Natural Gas Demand Growth

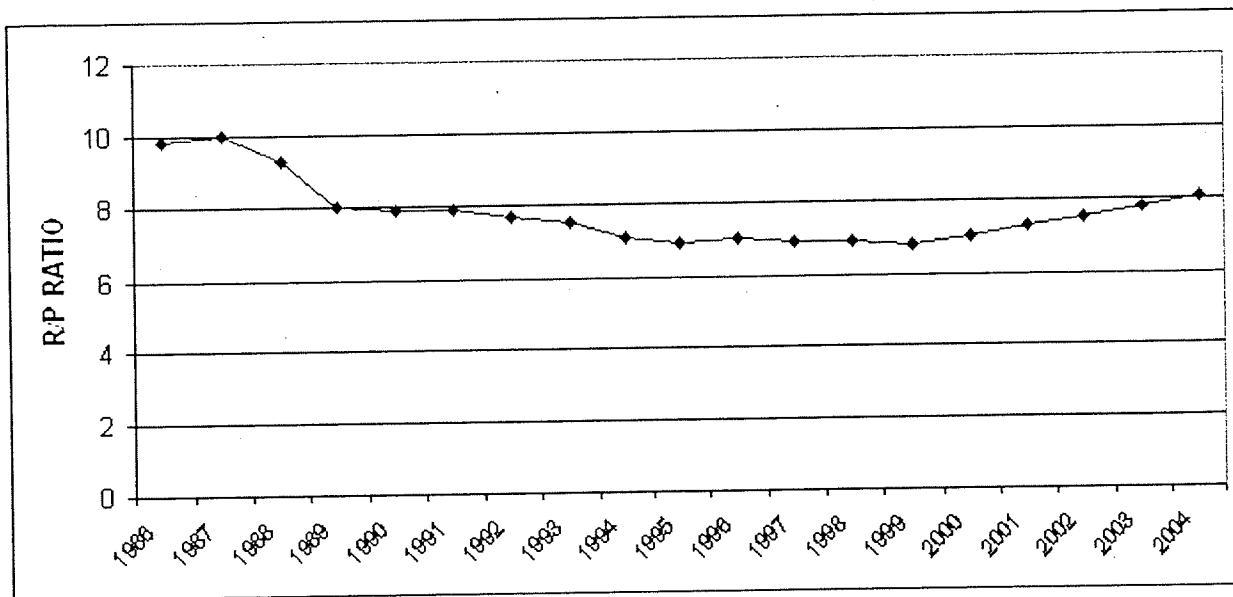


Short-Term Energy Outlook, January 2006



Source: Energy Information Administration, database.

EXHIBIT ES-3: NATURAL GAS RESERVE TO PRODUCTION RATIO



Source: Energy Information Administration, database.

EXHIBIT ES-7: WELLHEAD PRICES AND CHANGES IN TRADING ACTIVITY

ENRON
ENRON EXITS
RAMPS
UP

Source: Energy Information Administration, *Natural Gas Database*.

Energy & Natural Gas - LNG

California gas supply raises questions among state lawmakers

April 13, 2006 10:02 AM

By [Jeff Barron](#)

EXCLUSIVE

With the prospect of large amounts of LNG entering the California supply mix over the next three to five years, the California Legislature has called for an informational hearing to determine the state's future energy needs. The meeting, which was set for late March but delayed due to the funeral for a former legislator, may begin the legislative process to produce a plan for addressing the state's supply needs. The hearing also could raise some tough questions about the potential for LNG to meet California's energy needs.

The issue of how LNG development will affect energy supply in California comes on the heels of the March 13 announcement by Sempra Energy of an open season for 1.5 Bcf/d of additional capacity at its Energia Costa Azul LNG terminal in Baja California, Mexico. The open season would raise the potential capacity of the under-construction regasification terminal to 3.5 Bcf/d. Furthermore, Tidelands Oil & Gas Corp.'s Esperanza Energy LLC announced April 4 that it is evaluating potential sites for an LNG receiving terminal offshore of Southern California. Including Costa Azul and Esperanza Energy, there are currently nine LNG projects planned along the California coast and Baja California.

Questions about California's future supply mix are being spearheaded in the state Legislature by Democratic Sen. Martha Escutia, who chairs the Committee on Energy, Utilities and Communications.

"In terms of investigations, [several months ago] Sen. Escutia requested essentially an analysis of the natural gas market conditions in North America from our energy commission and public utility commission," said Lawrence Lingbloom, a staff member for the Committee on Energy, Utilities and Communications. "A preliminary report has been provided to her, and that is partly the basis for our next hearing on the subject."

The committee is looking into a variety of issues concerning California's energy sector, including the natural gas market structure, gas pricing, as well as issues associated with LNG. The upcoming hearing will also cover the conditions of long-term supply of natural gas into California, taking all potential supply locations into account.

"We are recognizing an issue here, and trying to use the committee to educate other members and the administration and the public about a potential crisis for California," said Lingbloom. "It's an information hearing, and if the chairs or other members are moved by the information to introduce legislation, then sometimes that happens."

One particular issue is the location from where California will receive its natural gas supply. "Whether that [supply] is from Alaska, Australia, Wyoming or Texas," explained Lingbloom, "the question is: What is the plan to ensure that we have the resources we need to meet our electric generation, heating and industrial demands for natural gas?"

Escutia's office calls it "a little odd" that, given the state's high reliance on natural gas, California has not adequately studied the issues surrounding the procurement of a reliable supply at affordable prices.

"Compared to the rest of the country, we have greater reliance on natural gas for home heating and appliances and also for electric generation, and we have more risks of supply disruption and price volatility," Lingbloom said. "We import 87% of our gas from supplies that can be diverted to other markets."

One concern with LNG highlighted by Lingbloom is that it could be diverted to other international markets, raising the potential for future supply disruptions in California.

Not everyone agrees, however, that further study is necessary to see that California is facing a potential natural gas crisis.

"We've been out there in front trying to develop a framework for California that would enable new supplies to create greater diversity of supply choices for our customers, up to and including more gas access to the Rockies as well as liquefied natural gas receiving terminals," explained Rick Morrow, vice president of customer service for major markets at Sempra Energy subsidiary Southern California Gas Co. "The CEC [California Energy Commission], I think, has a very similar view on the world that we do, and share the notion that supply diversity is important. They see LNG being a part of it in California."

SoCalGas, which is the largest natural gas distributor in California, points to the February 2006 report, "The Impacts of Natural Gas Prices on The California Economy: Final Report," which was prepared for the California Natural Gas Advisory Group. The report cites a November 2005 forecast by the CEC predicting that total demand for gas in California will grow at an annual rate of 0.55% over the next decade, including a growth rate of 1.76% per year in the commercial sector and 1.33% per year in the residential sector.

The report points out that demand growth in California will depend heavily on the use of natural gas in power generation, as 49% of the electricity generated and 41% of the electricity consumed in California in 2001 was produced from natural gas.

"Adding pipeline capacity may not be enough to guarantee adequate supply, as several of the North American basins upon which California depends for much of its natural gas face long-term production declines," the report says.

The report estimates that Californians could spend anywhere between \$20.3 billion and \$33.2 billion in 2016 on natural gas, depending on the ability to access adequate low-cost supply. It is further estimated that this difference in total amount spent on natural gas could result in the loss of an additional 163,000 jobs across the state, an additional \$15.3 billion drop in real wages and salary disbursement, an additional \$20.7 billion fall in personal income and a further \$30.4 billion fall in real gross state product.

SoCalGas has roughly estimated that its customers could benefit by close to \$1 billion per year in lower costs from the introduction of LNG, compared to what would happen if no new supplies entered the system.

"Right now we are on the West Coast in California, receiving our supplies traditionally from the San Juan basin [in the] New Mexico area, the Permian Basin in Texas, a little bit from Oklahoma, some from Canada and a very little bit from California," Morrow said. "We concluded that we needed more access into the Rockies — the Rockies has become the future frontier that will be developed very aggressively in the near term — but it is not in any way going to offset the declining resource base we're seeing in the traditional areas."

SoCalGas "can't just sit back and rely on the Rocky Mountains to fill the gap," Morrow added. "We are required to get creative to look for diverse supply sources for our customers. We strongly believe that having more supply sources for our customers will create greater gas on gas competition, will keep the suppliers of gas working to keep their costs as low as possible ... and it will create substantial benefit to our customers in the long term," he concluded.

Although the logic that more supply would lead to lower prices makes economic sense, some believe that the equation is not so clear.

"The simple-minded economics 101 argument is that if you increase supply, it depresses prices, but it is a little more complicated," said Rich Ferguson of the Center for Energy Efficiency and Renewable Technologies. "First, you have to be able to guarantee that in fact you can bring in the [LNG] supply at a lower cost than domestic supply, which isn't clear that it will happen, depending on world demand. Second of all, you don't know what is going to happen to domestic production as a result. If that just means that we dry up an equal amount of domestic production, then we haven't got ahead of the game."

In particular, Ferguson pointed out that LNG could affect production in the Rocky Mountains.

"[LNG and Rocky Mountain gas] are the two marginal supplies right now, so they are going to compete," he said. "Whoever wins, the other is going to lose."

"But, depending on what happens in the international market, if the international price for LNG was the cost of production, they could beat the Rocky Mountain price," Ferguson added.

Furthermore, there is the potential that gas brought into California through LNG terminals could move out of the state to other parts of the country. "The politicians are going around pretending that if we build a terminal it is now our gas, but it's going to go on the pipeline and be sold nationwide just like all the rest of the gas," Ferguson explained.

Bill Powers of the Border Plants Working Group took the argument for LNG in California one step further, questioning the underlying rationale for international imports. "Why are we even talking about this, before determining whether California needs LNG?" Powers asked.

Specifically, he took issue with what he describes as the two benefits that have been used to justify LNG development on the West Coast, namely that California is facing an impending domestic gas shortage, and LNG will lower the price of gas.

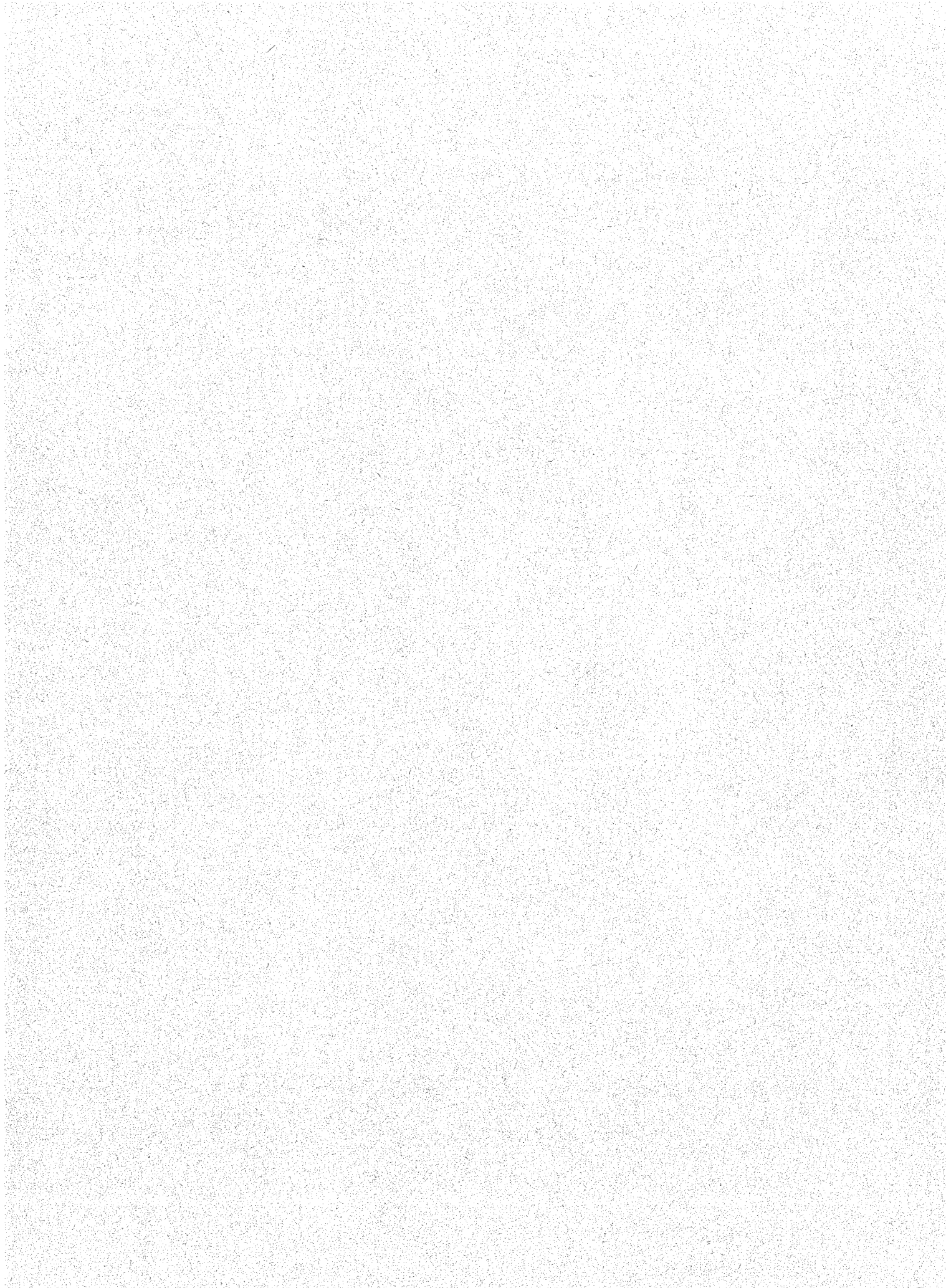
"The price of gas has dropped by 60% in the past two-and-a-half months," Powers said. "The answer would have seemed to have been obvious a couple months ago, but now with gas at average spot of \$6/MMBtu [the settlement price for the May 2006 contract on NYMEX was \$6.808/MMBtu on April 12] and heading south, maybe a product that is going to cost \$5 to import, even at the moment, maybe isn't such an overwhelming benefit."

Of particular concern to Powers is the use of "supply diversity" to justify the need for LNG.

"All you have to use in establishing your contract terms is the mantra 'supply diversity', and you can set the terms that are appropriate," Powers said. "Because they have said [that] there is a qualitative value here that is not necessarily monetarily measurable, which is supply diversity, we may end up paying a hell of a premium for a supply diversity that we didn't need and definitely doesn't provide us with more security given that it is coming from up to a 10,000-mile supply chain from who knows where."

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SNL Financial LC, One SNL Plaza, PO Box 2124, Charlottesville, Virginia 22902, (434) 977-1600



Nick Snow
Washington Correspondent

WASHINGTON, DC, Apr. 3 -- US natural gas reserves at the end of 2005 were at their highest level since 1984, the American Gas Association reported Mar. 31.

Reserves grew to more than 197 tcf from 193 tcf at the end of 2004, AGA said. The annual analysis is based on figures reported by the 30 largest domestic reserves holders, who account for about half of the US total.

Production growth hasn't followed the increase in reserves, noted Chris McGill, AGA's managing director of policy analysis.

"In 2005, over 27,000 gas wells were completed in the United States, which is the highest level of completions on record," he said.
"However, most of these wells were drilled onshore in shale, tight sands, and coal seams, which are low-yield and slow-yield resources."

AGA said operators produced 18.3 tcf of gas in the US last year, down slightly from 2004, largely due to hurricanes in the Gulf of Mexico.

At the same time, drilling and revisions to earlier estimates added as much as 35.7 tcf to reserves, allowing total domestic reserves to grow for a 7th consecutive year.

AGA expects production capacity to remain at 18-19 tcf/year for the foreseeable future unless policies change to increase producer access to US resources.

Contact Nick Snow at nsnow@cox.net.

